635 S8
325.33
Rm0

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project | Date | Author

TITLE

FOREST INSECT SURVEY - SEASON OF 1942
STANISLAUS NATIONAL FOREST, CALIFORNIA

by

John E. Patterson and Geo. R. Struble
Berkeley, California
March 3, 1943

Annex 1
SB
763
.C2 S8
1942

SUBJECT—

INDEX NO.—

U. S. GOVERNMENT PRINTING OFFICE 8—9742

Forest Insect Laboratory
Berkeley, California
March 3, 1943

FOREST INSECT SURVEY - SEASON OF 1942
STANISLAUS NATIONAL FOREST, CALIFORNIA

APPROVED BY:

F. P. Keen
Senior Entomologist, In Charge

SUBMITTED BY:

John E. Patterson
Entomologist

Geo. R. Struble
Associate Entomologist

ABSTRACT OF THE RESULTS OF 1942 FOREST INSECT SURVEY
STANISLAUS NATIONAL FOREST, CALIFORNIA

A. The 1941 Infestation (completed records).

1. Total pine timber killed on reporting areas. (Tables 2 and 3)

a.	Number of trees, PP-SP-JP.	2,961
b.	Volume, PP-SP-JP.	2,399,000 board feet
c.	Average volume per acre, PP-SP	12 board feet
	JP	4 board feet

2. Present classification - low endemic.

3. Primary insects - Western pine beetle in ponderosa pine
Mountain pine beetle in sugar pine
Jeffrey pine beetle in Jeffrey pine.

4. Trend - substantial decrease over 1940.

5. Control work completed - Direct control work by the peeling-burning method was carried out in June, 1942, on the Pinecrest Unit. This project was recommended by the Bureau of Entomology following the survey of October, 1941, when it was found that an aggressive infestation of the mountain pine beetle was threatening the mature to old sugar pine in the virgin stands of the commercial-recreational area. The project embraced an area of 5,760 acres. A total of 46 large-sized sugar pine trees infested with broods of the mountain pine beetle were treated. The loss reduction during the first year after control amounted to 93 percent.

B. The 1942 Infestation (partial records).

1. Primary insects - Western pine beetle in ponderosa pine
Mountain pine beetle in sugar pine
Jeffrey pine beetle in Jeffrey pine.

2. Probable trend - reduction over 1941.

3. Control recommended - none.

FOREST INSECT SURVEY - SEASON OF 1942
STANISLAUS NATIONAL FOREST, CALIFORNIA

INTRODUCTION

The annual forest insect survey of the Stanislaus National Forest was made on October 16-18, 1942, by J. E. Patterson and C. R. Struble of the Berkeley Station of the Bureau of Entomology and Plant Quarantine. This survey, in line with surveys of previous years, was made to determine the extent and character of insect-caused losses to ponderosa pine, sugar pine and Jeffrey pine.

At the outset, it was found that the type of survey formerly followed on this forest was no longer possible since many of the virgin stands of timber have been logged, are being logged or are included in current working circles. With the exception of the Mokelumne Plot, all the sample RS survey plots set up on this forest from 1930 to 1934 have either been logged or are immediately adjacent to logged areas which, in either case, render them of little value as infestation indicators. Because of these conditions, the 1942 survey was largely of the reconnaissance type.

Due to the previously described physical changes brought about on this forest, the former method of survey has been made obsolete, and it will be necessary in the future to inaugurate another method making use of a different form of sampling. A form of road-strip sampling for determining and recording insect losses is now being tested and if found adequate will be proposed for future surveys on the Stanislaus National Forest.

The reconnaissance survey of 1942 was amplified by roadside strips in heavily timbered areas which could not be seen from lookout points, or where some sampling of the infestation was desired. These conditions were encountered on the heavily timbered Mokelumne watershed, on the upper Stanislaus River drainage north of Strawberry and in the Buck Meadows district.

Insect losses in general during 1942 were so low that any attempt to estimate the amount of damage in relation to the stand is of little significance. It is estimated that at least 75 percent of the 1942 loss was noted in this survey; the remaining 25 percent will be reported in the 1943 survey record. It was obvious that the infestation had reached a very low point, and in relation to previous infestations should be considered decidedly low endemic.

Accompanying this report are two maps: one of the north Stanislaus, and one of the Stanislaus-Yosemite infestation areas. These have been subdivided into reporting units referred to later in this report. The location of the roadside strips set up in the survey is shown on these maps in red lines.

RESULTS OF THE SURVEY

Character of the Infestation:

Western pine beetle activity in virgin ponderosa pine stands during 1942 was confined to occasional trees of intermediate size and decadent crowns. No indications of aggressive attacks were found anywhere in the forest. The infestation was limited to single trees widely separated; grouping of attacks was not observable in any part of the forest. These conditions prevailed in the better type stands in the Mokelumne, Dorrington and Jawbone districts as well as in the fringe type forests in the Groveland-Buck meadows district.

This beetle developed greater activity in the recently logged areas in the Big Creek unit on the south Tuolumne River drainage during the year. Here the reserve stands were generally infested although the infestation cannot be considered epidemic in character. The loss during the year in these reserve stands is estimated to be about 42 trees per section.

Mountain pine beetle activity in virgin pine stands was generally lower that in 1941 on all units. Except for some local activity in sugar pine on the areas north of Cow Creek, the Pinecrest unit which contained the heaviest 1941 infestations on the forest was in 1942 relatively free from attacks. This condition is evidently due to the direct control work carried out on this unit in the spring of 1942 which reduced the beetle population to a low point. The value of this control work is well demonstrated by conditions on the adjacent area north of Cow Creek where losses continued as high as in 1941.

Attacks in Jeffrey pine by the Jeffrey pine beetle along the watershed of the upper middle fork of the Stanislaus River were less than they have been for the past several years. Here again the value of control work is well demonstrated since damaging infestations have not occurred on any part of this watershed following the control work carried out in 1939-1940 in the Clark's Fork and Brightman Flat units.

An indication of the generally low infestations in all species is shown by a tabulation of losses on roadside strips shown in Table 1.

Table 1. Summary of Pine Losses on Sample Roadside Strips. Stanislaus National Forest, California.

Unit	Timbered Acreage	Trees Killed PP	SP	JP	Volume (b.m.) Per Acre PP	SP	JP
Bloods	80 A	0	0		0	0	
Blue Mountain	120 A	0	0		0	0	
Folsom	235 A	1	0		4	0	
Cow Creek	300 A	1	2		24	33	
Clark's Fork	200 A			2			8
Buck Meadows	268 A	1	0		2	0	

The estimated unit pine losses and loss per acre by units from 1940 to 1942 are shown by Tables 2 and 3.

Table 2. Estimated Pine Losses by Entomological Units.
Stanislaus National Forest - 1940 to 1942, Inclusive.

Entomological Unit	Acreage	SPP.	1940 No. Trees	1940 MBM	1941 No. Trees	1941 MBM	1942 No. Trees	1942 MBM
Folsom	12,480 A	PP-SP	100	60	140	70	50	25
Hermit Spgs.	16,180 A	PP-SP	280	190	240	170	65	35
Mokelumne	17,400 A	PP-SP	350	525	250	375	135	202
Blue Mountain	16,500 A	PP-SP	120	60	70	40	65	45
Stanislaus	27,200 A	PP-SP	600	720	375	560	105	160
Dorrington	24,700 A	PP-SP	280	90	200	80	90	35
South Grove	12,400 A	PP-SP	165	100	105	63	40	24
Skull Creek	21,800 A	PP-SP	275	190	175	120	60	42
Smoothwire	22,000 A	PP-SP	340	320	300	270	120	108
Dry Meadows	14,500 A	PP	150	90	90	56	26	16
Mt. Knight	25,400 A	PP	60	30	40	25	20	12
Lyons	15,200 A	PP	90	36	50	20	10	4
Confidence	22,000 A	PP	80	40	60	24	15	9
Long Barn	15,200 A	PP-SP	50	40	30	22	20	14
P inecrest	11,500 A	PP-SP	150	98	180	135	5	10
Clavey	26,200 A	PP-SP	50	25	30	15	10	5
Cherry Valley	9,000 A	PP-SP	28	42	20	30	cut	over
Jawbone	30,200 A	PP-SP	80	96	60	70	35	40
Canyon	10,000 A	PP	10	5	6	3	0	
Groveland	18,200 A	PP	75	25	60	15	40	12
Buck Meadows	30,400 A	PP	150	45	120	36	80	24
Bull Creek	19,200 A	PP	60	12	40	8	25	20
Big Creek	14,200 A	PP-SP	50	25	45	24	cut	over
Ackerson Mdw.	17,600 A	PP-SP	60	35	40	24	cut	over
Anderson Vly.	12,200 A	PP	50	20	30	15	10	5
Moss Creek	5,600 A	PP	25	10	15	6	5	2
Clark's Fork	6,000 A	JP	40	32	20	16	7	6
Brightman	5,800 A	JP	25	10	10	7	4	3
Dardanelle	16,300 A	JP	120	96	90	72	30	24
Dodge Ridge	23,000 A	JP	100	40	70	28	30	12
Totals	518,360 A		4,013	3,107	2,961	2,399	1,102	894

Table 3. Estimated Pine Loss per Timbered Acre by Entomological Units. Stanislaus National Forest - 1940 to 1942, Inclusive.

Entomological Unit	Timbered Acreage	SPP.	1940 BM per Acre	1941 BM per Acre	1942 BM per Acre
Folsom	7,600	PP-SP	8	10	3
Hermit Spgs.	8,000	PP-SP	24	21	4
Mokelumne	9,600	PP-SP	55	40	21
Blue Mountain	6,400	PP-SP	9	6	7
Stanislaus	6,000	PP-SP	120	93	27
Dorrington	13,000	PP-SP	7	6	3
South Grove	4,000	PP-SP	25	16	6
Skull Creek	13,000	PP-SP	15	9	3
Smoothwire	7,600	PP-SP	42	36	14
Dry Meadow	3,000	PP	30	18	5
Mt. Knight	6,000	PP	5	4	2
Lyons	2,500	PP	10	8	2
Confidence	2,500	PP	16	10	4
Long Barn	3,000	PP-SP	13	7	5
Pinecrest	3,500	PP-SP	30	44	3
Clavey	6,400	PP-SP	4	2	1
Cherry Valley	3,600	PP-SP	12	8	cut over
Jawbone	16,000	PP-SP	6	5	3
Canyon	2,000	PP	3	2	0
Groveland	7,600	PP	3	2	2
Buck Meadows	25,600	PP	2	1	1
Bull Creek	12,800	PP	1	1	2
Big Creek	5,700	PP-SP	4	4	cut over
Ackerson Meadow	5,700	PP-SP	6	4	cut over
Anderson Valley	6,000	PP	3	3	1
Moss Creek	2,500	PP	4	2	1
Totals	189,600		457	362	120
Averages	7,292		15	12	5
Clarks Fork	3,500	JP	10	5	2
Brightman	4,400	JP	2	2	1
Dardanelle	7,600	JP	12	10	3
Dodge Ridge	12,800	JP	3	2	1
Totals	28,300		27	19	7
Averages	7,075		6	4	2

Trend of the Infestation:

The pine beetle situation on the Stanislaus Forest showed a marked improvement in 1942. There was a substantial decrease in insect-caused losses as compared to those of the two previous years. This downward trend was general over the entire forest but was more pronounced in the fringe type than in the better sites on the higher elevations. As in 1940 and in 1941, losses on the Mokelumne and Stanislaus units were higher than on the other units of the forest, but these conditions are far from serious and have recently decreased. There was no marked difference in the activity of the three primary insects involved in these infestations, or in the tree species attacked. All showed the same trend toward decreasing infestations.

Insects Involved:

The western pine beetle, Dendroctonus brevicomis Lec., was the most abundant of the insects found in attacked trees. This species is specific to ponderosa pine. The mountain pine beetle, Dendroctonus monticolae Hopk., was found principally attacking sugar pine, but also sparingly in ponderosa pine. It was the insect primarily involved in the control project carried out on the Pinecrest unit in the spring of 1942, and is the species responsible for the death in 1942 of several large sugar pine trees in the Cow Creek-Niagra Creek area. The Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., was confined to the Jeffrey pine stands and losses in this species were due almost entirely to the activity of this bark beetle.

RECOMMENDATIONS

No areas on the Stanislaus Forest were found to have infestations sufficiently damaging to warrant direct control measures. On all the units, low endemic conditions prevailed and because of the widely scattered distribution of infested trees and the non-aggressive character of infestations, it is believed that the current low status will prevail through 1943 at least. Certain areas where recent decrease in infestations has not kept pace with general conditions should be watched during 1943 to detect a possible increase in losses. Such conditions are found locally on the Mokelumne and Stanislaus units and in the sugar pine-Jeffrey pine stands between Cow Creek and Niagra Creek.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA

FOREST INSECT SURVEY

STANISLAUS-YOSEMITE INFESTATION AREA

MT. DIABLO MERIDIAN, CALIFORNIA

LEGEND

N

SCALE 0 ½ 1 2 3 4 INCHES MILES

SAMPLE PLOT

UNIT BOUNDARY

ROAD STRIP

1.0' 120° 00' 5.0' 4.0'

38° 00'

50'

40'

T. 3 N.

T 2 N

T. 1 N.

T. 1 S.

T. 2 S.

T. 3 S.

R. 16 E. R. 17 E. R. 18 E. R. 19 E. R. 20 E. R. 21 E. R. 22 E.

20'
10'
120° 00'
50'
38° 20'
38° 10'
T.7 N.
T.6 N.
T.5 N.
T.4 N.
T.3 N.
T.2 N.
R.14 E.
R.15 E.
R.16 E.
R.17 E.
R.18 E.
R.19 E.
R.20 E.

LEGEND

UNIT BOUNDARY

SAMPLE PLOT

N

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA

FOREST INSECT SURVEY
NORTH STANISLAUS INFESTATION AREA

MT. DIABLO BASE LINE
CALIFORNIA

SCALE
0 ¼ 1 2 3 4 Miles
In.

ROAD STRIPS

HERMIT
FOLSOM SPRING
MIDDLE FORK MOKELUMNE R.
SOUTH FORK MOKELUMNE R.
NORTH FORK MOKELUMNE R.
MOKELUMNE RIVER
FK. MOKELUMNE RIVER
BEAR RIVER
MIDDLE FORK STANISLAUS
STANISLAUS
CLARK FORK
BRIGHTMAN
DANIELS
DORRINGTON
SOUTH GROVE CREEK
NORTH GROVE CREEK
SKULL
DRY YORK
SOUTH FORK STANISLAUS
PINE
KNIGHT
MEADOW
BARN
DODGE
RIDGE
YOSEMITE
SOUTH FORK TUOLUMNE
LONG
CLAVEY
CONFIDENCE
Deadman Flat
SALT SPRINGS RESERVOIR
Garnett Hill
Moore Cr.
Jelmini Basin
MATTLEY
Devils 4880 Nose
Hunter Flat
Blue
Bear
Mid.
Creighton
Mitchell Mill
Licking Fk.
S. Fork
Fort Mt
Blue Mt.
LOOKOUT
Dorrington
Calaveras Big Trees HOTEL
Calaveras Big Trees S.P.
Calaveras Grove
Squaw Hollow
Sheep Ranch
Avery
HUNTER RESVR.
CALAVERAS
Oxendine
Darby Knob
Mt. Knight
Murphy
Stanislaus
Douglas Flat
Vallecito
Moaning Cave
Italian Bar
Mt. Elizabeth LOOKOUT
4938
Yankee Hill
Petersen
Parrott
Springfield
Columbia
Bald Mt.
Belleview
Confidence
Mt. Lewis
Mt. Provo
The Basin
Rosasco
Highland Lks.
Gardner Mdw.
Arnot Pk.
Iceberg Pk.
9751
Disaster Pk.
10022
The Iceberg
ICEBERG G.S.
Red Pk.
9951
Bald Pk.
Douglas Cr.
Eureka
B.M. 6076
DOUGLAS RESORT
DEADMAN CR. P.G.S.
KENNEDY
Kennedy Mdw.
Salt Spr
Corral Mdw.
Big Prather Mdw.
Lit Prather Mdw.
Randalls Mdw.
Shufly Mdw.
Sands Mdw.
Horse Mdw.
Bummers Flat
Dome Rock
6638
Clover Mdw.
Twin Mdws.
Montgomery Mdw.
Rhodes L.
Moran L.
Big Meadow Cr.
Gardner Mdw.
SPICER MDW. RESVR.
DARDANELLES CONE
9502
McCormick Cr.
Drew Cr.
Wheatsville Mdw.
Wheatsville Cr.
Dardanelles Cr.
Niagara Cr.
NIAGARA CREEK
MILL CR. GROUND
CASCADE CR. P.G.S.
Cascade Cr.
LILY CR. CAMP
7200
MUTTON CAMP
Pikes Pk.
HERRING RES.
Bull Run Pk.
HELLS HALF ACRE BR.
COW CR. P.G.S.
B.M. 5769
COW CR. G.S.
Leland Mdw.
PINECREST Pk.
LOOKOUT
Strawberry Pk.
Strawberry L.
Pine Crest
GOOSEBERRY CAMP
Bell Mdw.
Cold Spr.
B.M. 5697
Dodge Mdw.
Coffin Hollow
Clear L.
Bourland Mt.
7875
Clavey Mdw.
Lost Cr.
Lit Reynolds Cr.
Reynolds Cr.
Foley Mdw.
Hull
Hulls
Wrights
Lily Cr.
Rock Cr.
Trout Cr.
Rose Cr.
Eagle Cr.
Knight
Spaulding
Gold Crater Mine
Contention Mine
Jupiter
Stage
Kinney O.S.
Griesbt.
Willer
Rushing
Empire Mill
Saints Rest
Browns Mdw.
Merrill Sprs.
Lyons Dam
Long Barn
Lyons Cr.
Dry Cr.
Williams
Sonnet
Star Mine
Kelly Mine
Riverside Mine
American Camp G.S.
American Camp Look-Out
Abbott Ferry
Natural Bridge
Ferry Br.
Fivemile Cr.
Halls Crossing Bridge
Center Camp G.S.
Twain Harte Lodge
Barrett
Lewis
Lewis Mine
Green Mine
Sledge Mine
Casa Madera Mine
Gruwell
Rosasco
Robinson Ferry
Stanislaus River
Coyote Cr.
Moaning Cave
Mercer Cave
Forebay
Forebay L.T.
Ph.
Kunz Mill
Busse
Schoettgen
Shaffer Brady
Camp Crandall
Spring Gap
Penstock
Pitch
Baker Bridge
Spring Gap P.H.
Strawberry Resort
Sand Bar Flat
Dry Meadow Cr.
Dry Meadow G.S.
Ariola Camp
Chinaman Cr.
Cow
Lookout
Slash Disposal
Shumake
Fisher
Grobl
Grizwold
Loye
Soap Cr.
Mc Cormick Cr.
Mc Cormick L.T.
Mc Cormick Ex.
Hunter Resvr.
Calaveras
San Antonio
Chew
Manuel Mill
Moran
Big Trees
Big Trees S.P.
Squaw Hollow Bridge
Beaver Cr.
Lit Beaver Cr.
Brunner Camp
Fennessy
Grizzly Mdw.
N. Fk.
S. Fk.
Campbell Cr.
Shumachwing Cr.
Mill Cr.
Domelle Cr.
Lion Cr.
Beaver Cañ.
Sands Mdw.
Whittakers Dardanelles
Grohls Upper Camp
Cottage Spr.
Ariola Cr.
Ariola Camp
S. Fk. Bridge
Buck Ranch G.S.
Solinsky
Licking Fk. G.S.
Ramsey
Steel
Big Rattlesnake Cr.
Lit Rattlesnake Cr.
Cordes Camp
Person Mill
Bailey
Smith Hayward Cr.
Walters Camp
Gamns
Bailey
Hermit Spr.
Mokelumne River
SS-4
SS-5
SS-6
SS-1
Bruce Camp
Bridge
Bear River Camp
Walker
Clarks Mine
Cuneo
Barnett
Folsom-Hill Lkt.
Folsom G.S.
Log House
State Line
Lily Gap (State)
Tiger Cr.
Big Meadow Cr.
Big Trees
Hunter
Blue
Bear
Mid.
Creighton
Mitchell Mill
Licking Fk.
S. Fk.
Fort Mt
Blue Mt.
LOOKOUT
Dorrington
Calaveras Big Trees HOTEL
Calaveras Big Trees S.P.
Calaveras Grove
Squaw Hollow
Sheep Ranch
Avery
HUNTER RESVR.
CALAVERAS
Oxendine
Darby Knob
Mt. Knight
Murphy
Stanislaus
Douglas Flat
Vallecito
Moaning Cave
Italian Bar
Mt. Elizabeth LOOKOUT
4938
Yankee Hill
Petersen
Parrott
Springfield
Columbia
Bald Mt.
Belleview
Confidence
Mt. Lewis
Mt. Provo
The Basin
Rosasco
Highland Lks.
Gardner Mdw.
Arnot Pk.
Iceberg Pk.
9751
Disaster Pk.
10022
The Iceberg
ICEBERG G.S.
Red Pk.
9951
Bald Pk.
Douglas Cr.
Eureka
B.M. 6076
DOUGLAS RESORT
DEADMAN CR. P.G.S.
KENNEDY
Kennedy Mdw.
Salt Spr
Corral Mdw.
Big Prather Mdw.
Lit Prather Mdw.
Randalls Mdw.
Shufly Mdw.
Sands Mdw.
Horse Mdw.
Bummers Flat
Dome Rock
6638
Clover Mdw.
Twin Mdws.
Montgomery Mdw.
Rhodes L.
Moran L.
Big Meadow Cr.
Gardner Mdw.
SPICER MDW. RESVR.
DARDANELLES CONE
9502
McCormick Cr.
Drew Cr.
Wheatsville Mdw.
Wheatsville Cr.
Dardanelles Cr.
Niagara Cr.
NIAGARA CREEK
MILL CR. GROUND
CASCADE CR. P.G.S.
Cascade Cr.
LILY CR. CAMP
7200
MUTTON CAMP
Pikes Pk.
HERRING RES.
Bull Run Pk.
HELLS HALF ACRE BR.
COW CR. P.G.S.
B.M. 5769
COW CR. G.S.
Leland Mdw.
PINECREST Pk.
LOOKOUT
Strawberry Pk.
Strawberry L.
Pine Crest
GOOSEBERRY CAMP
Bell Mdw.
Cold Spr.
B.M. 5697
Dodge Mdw.
Coffin Hollow
Clear L.
Bourland Mt.
7875
Clavey Mdw.
Lost Cr.
Lit Reynolds Cr.
Reynolds Cr.
Foley Mdw.
Hull
Hulls
Wrights
Lily Cr.
Rock Cr.
Trout Cr.
Rose Cr.
Eagle Cr.
Knight
Spaulding
Gold Crater Mine
Contention Mine
Jupiter
Stage
Kinney O.S.
Griesbt.
Willer
Rushing
Empire Mill
Saints Rest
Browns Mdw.
Merrill Sprs.
Lyons Dam
Long Barn
Lyons Cr.
Dry Cr.
Williams
Sonnet
Star Mine
Kelly Mine
Riverside Mine
American Camp G.S.
American Camp Look-Out
Abbott Ferry
Natural Bridge
Ferry Br.
Fivemile Cr.
Halls Crossing Bridge
Center Camp G.S.
Twain Harte Lodge
Barrett
Lewis
Lewis Mine
Green Mine
Sledge Mine
Casa Madera Mine
Gruwell
Rosasco
Robinson Ferry
Stanislaus River
Coyote Cr.
Moaning Cave
Mercer Cave
Forebay
Forebay L.T.
Ph.
Kunz Mill
Busse
Schoettgen
Shaffer Brady
Camp Crandall
Spring Gap
Penstock
Pitch
Baker Bridge
Spring Gap P.H.
Strawberry Resort
Sand Bar Flat
Dry Meadow Cr.
Dry Meadow G.S.
Ariola Camp
Chinaman Cr.
Cow
Lookout
Slash Disposal
Shumake
Fisher
Grobl
Grizwold
Loye
Soap Cr.
Mc Cormick Cr.
Mc Cormick L.T.
Mc Cormick Ex.
Hunter Resvr.
Calaveras
San Antonio
Chew
Manuel Mill
Moran
Big Trees
Big Trees S.P.
Squaw Hollow Bridge
Beaver Cr.
Lit Beaver Cr.
Brunner Camp
Fennessy
Grizzly Mdw.
N. Fk.
S. Fk.
Campbell Cr.
Shumachwing Cr.
Mill Cr.
Domelle Cr.
Lion Cr.
Beaver Cañ.
Sands Mdw.
Whittakers Dardanelles
Grohls Upper Camp
Cottage Spr.
Ariola Cr.
Ariola Camp
S. Fk. Bridge
Buck Ranch G.S.
Solinsky
Licking Fk. G.S.
Ramsey
Steel
Big Rattlesnake Cr.
Lit Rattlesnake Cr.
Cordes Camp
Person Mill
Bailey
Smith Hayward Cr.
Walters Camp
Gamns
Bailey
Hermit Spr.
Mokelumne River
SS-4
SS-5
SS-6
SS-1
Bruce Camp
Bridge
Bear River Camp
Walker
Clarks Mine
Cuneo
Barnett
Folsom-Hill Lkt.
Folsom G.S.
Log House
State Line
Lily Gap (State)
Tiger Cr.
Big Meadow Cr.